

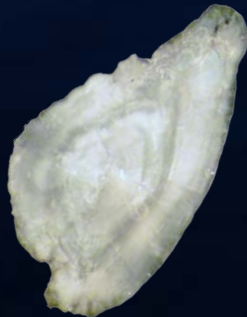
Maternal Life-History Type and Natal Rearing Origin of Adult Steelhead in the Yakima Basin

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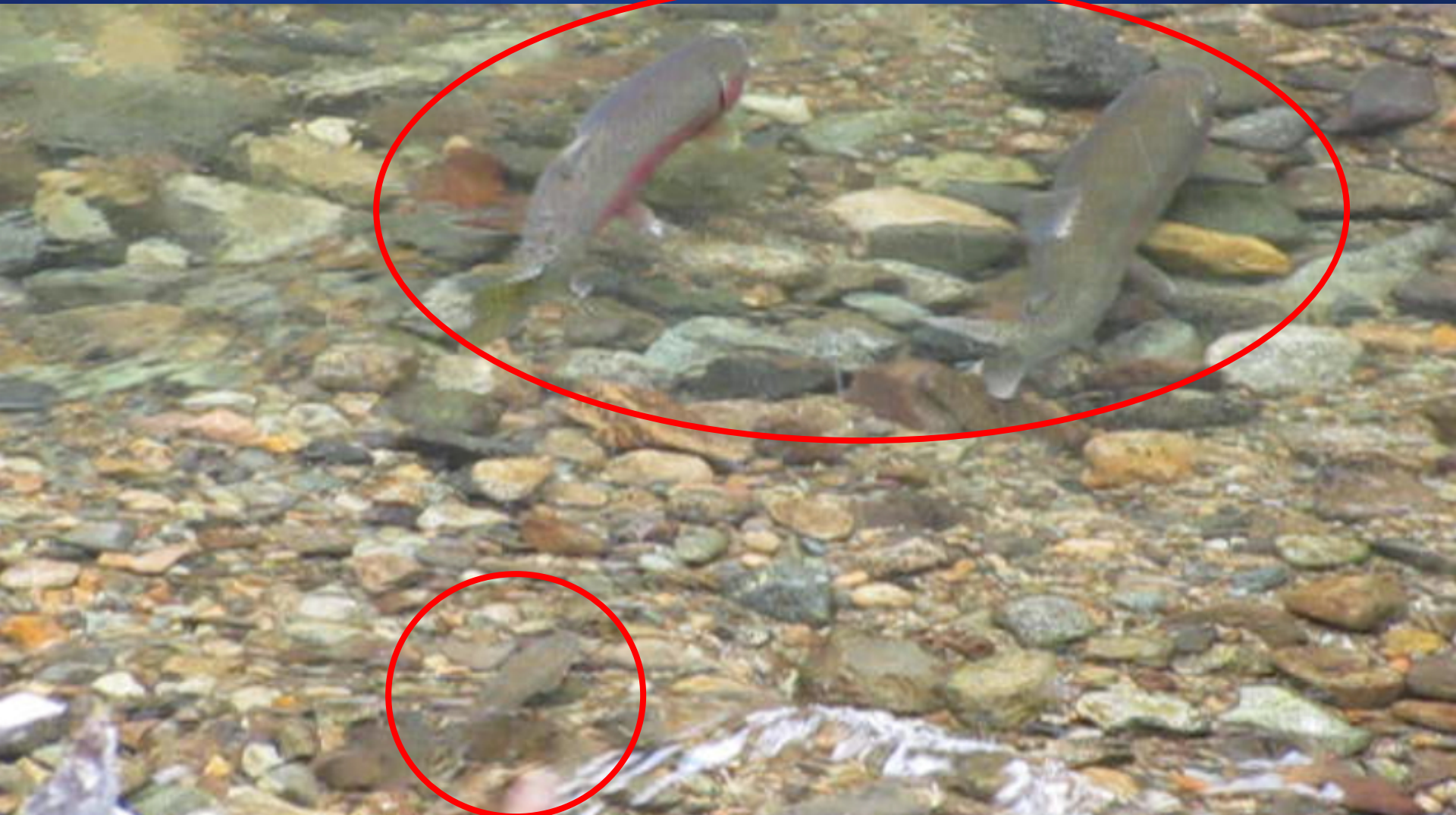


Photo Credit Eric Anderson

Hypotheses

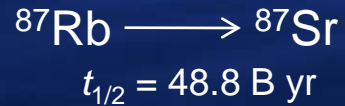
A significant number ($\geq 10\%$) of resident rainbow trout offspring migrate to the ocean and return as adult steelhead.





Otolith strontium isotope geochemistry

Radiogenic Decay



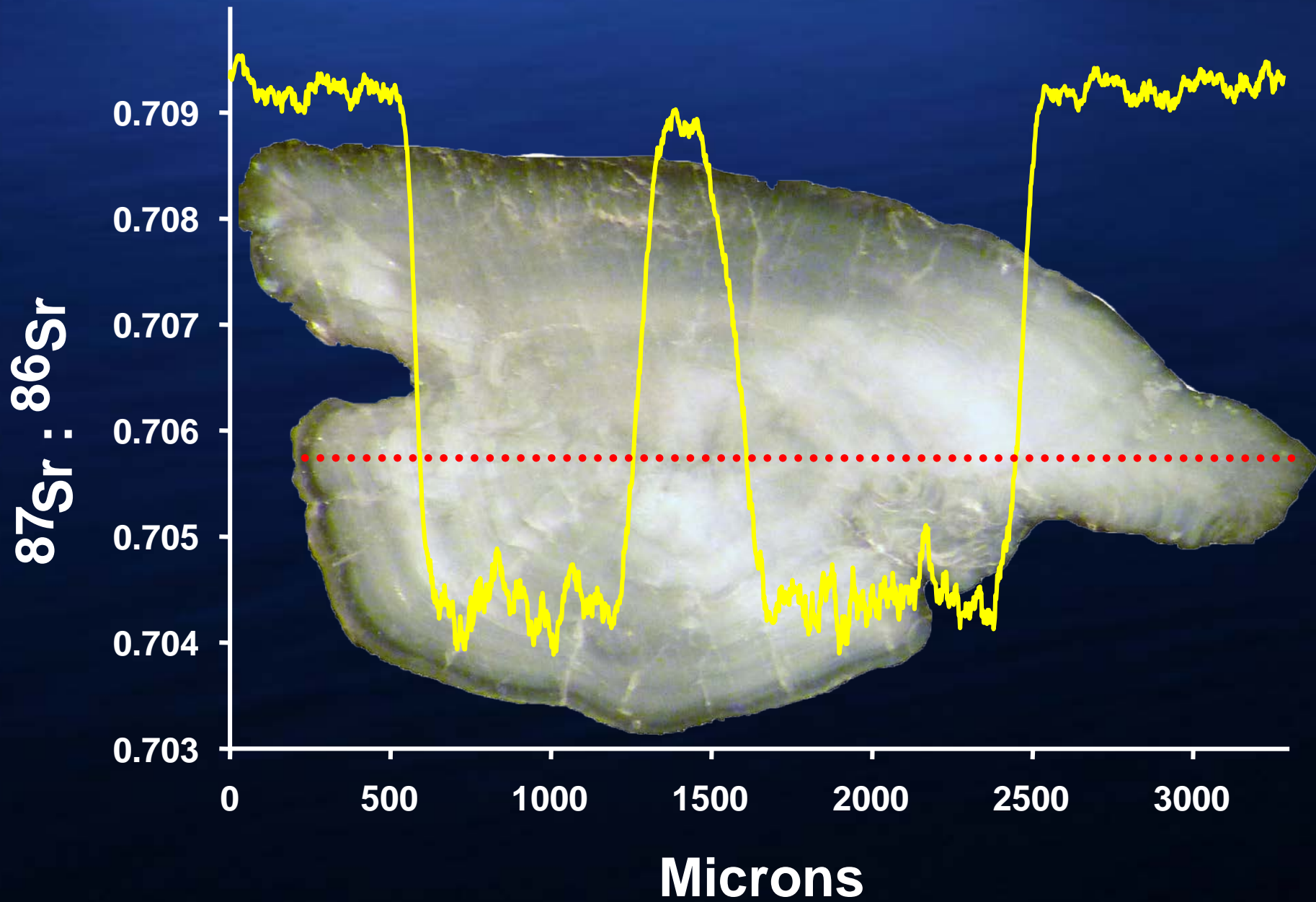
Natural abundance of strontium isotopes

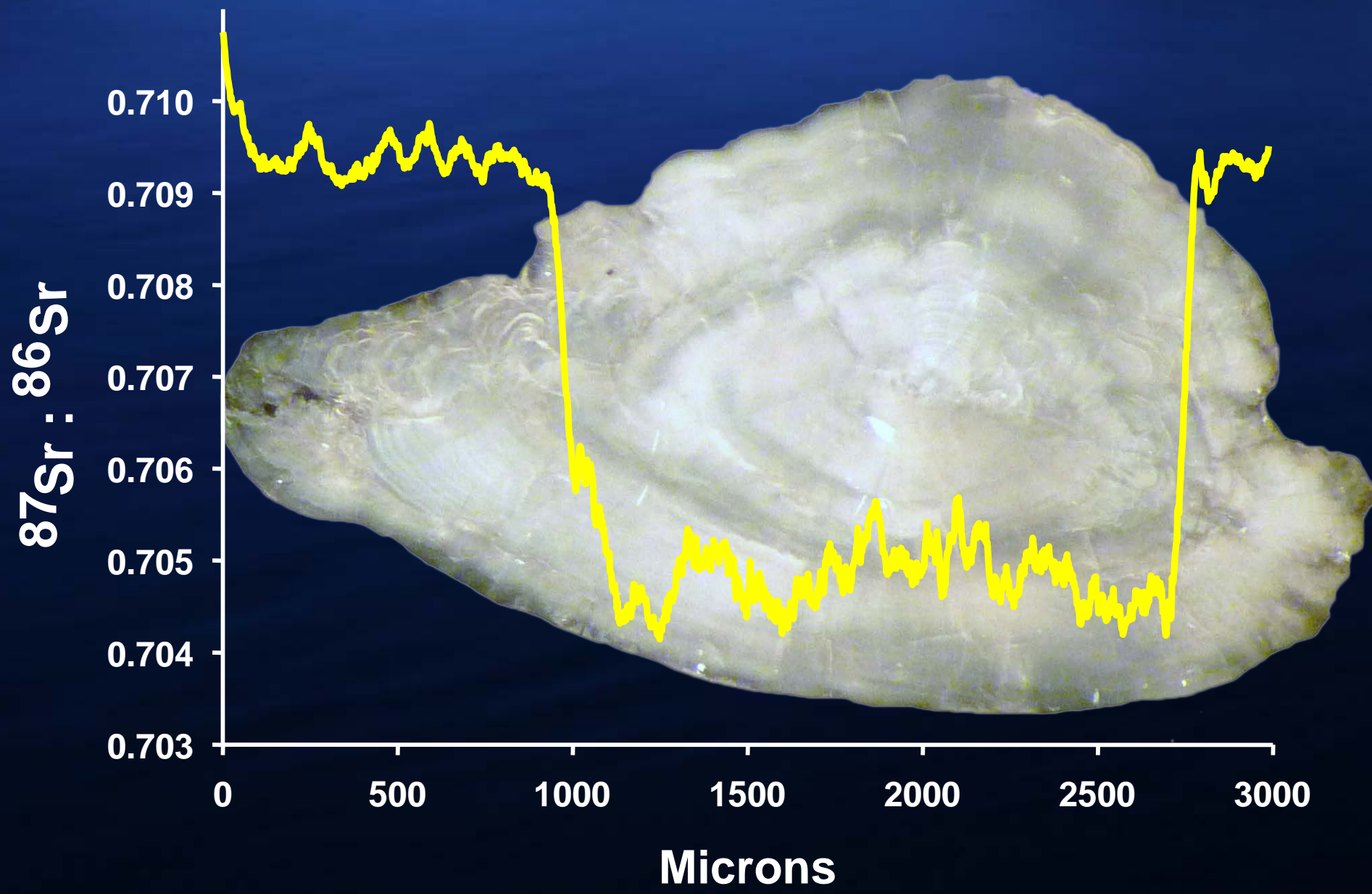
$${}^{87}\text{Sr} = 7\% = 0.7\ldots$$
$${}^{86}\text{Sr} = 10\%$$



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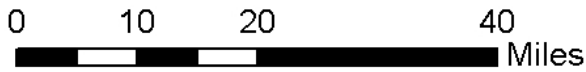
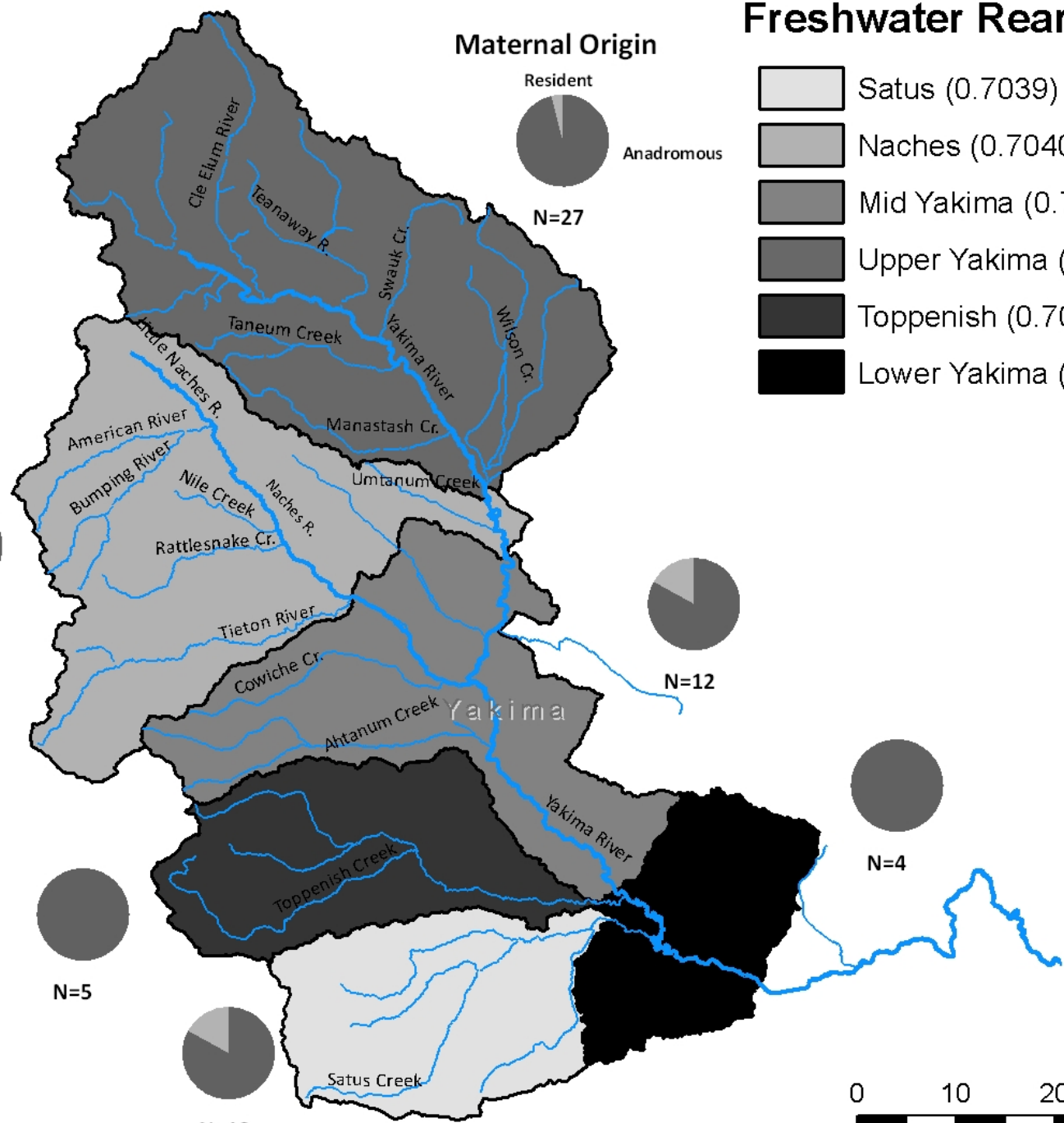
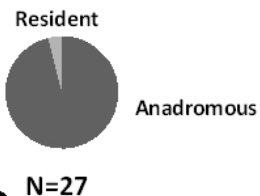
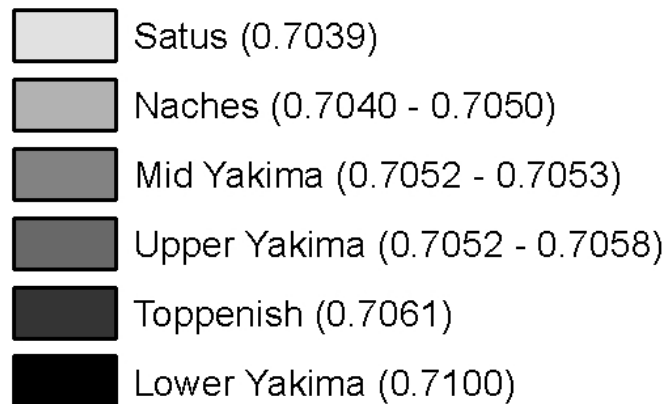


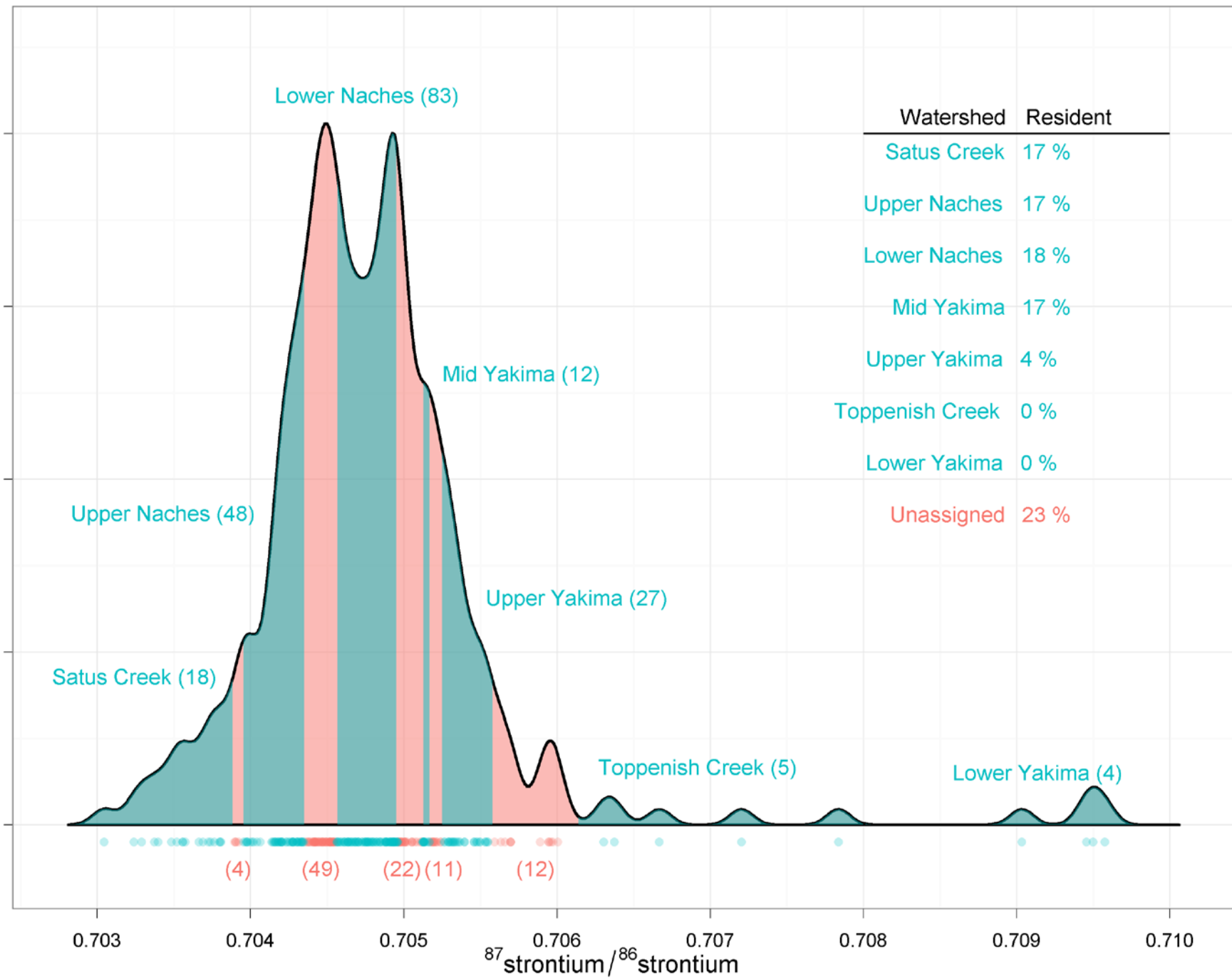




Freshwater Rearing Regions

Maternal Origin





Conclusions

- *O. mykiss* populations in the Yakima Basin are partially anadromous, and significant numbers of offspring from resident trout are adopting an anadromous life-history.
 - 17% resident maternal origin
 - 30% or more have at least one resident parent
- The upper basin may be more influential than previously thought
- Management implications?

Plans for 2011

- Collect additional water samples in Satus Creek, Toppenish Creek, and Lower Yakima River.
- Collect a representative sample of the entire kelt emigration
- Develop additional validation tests







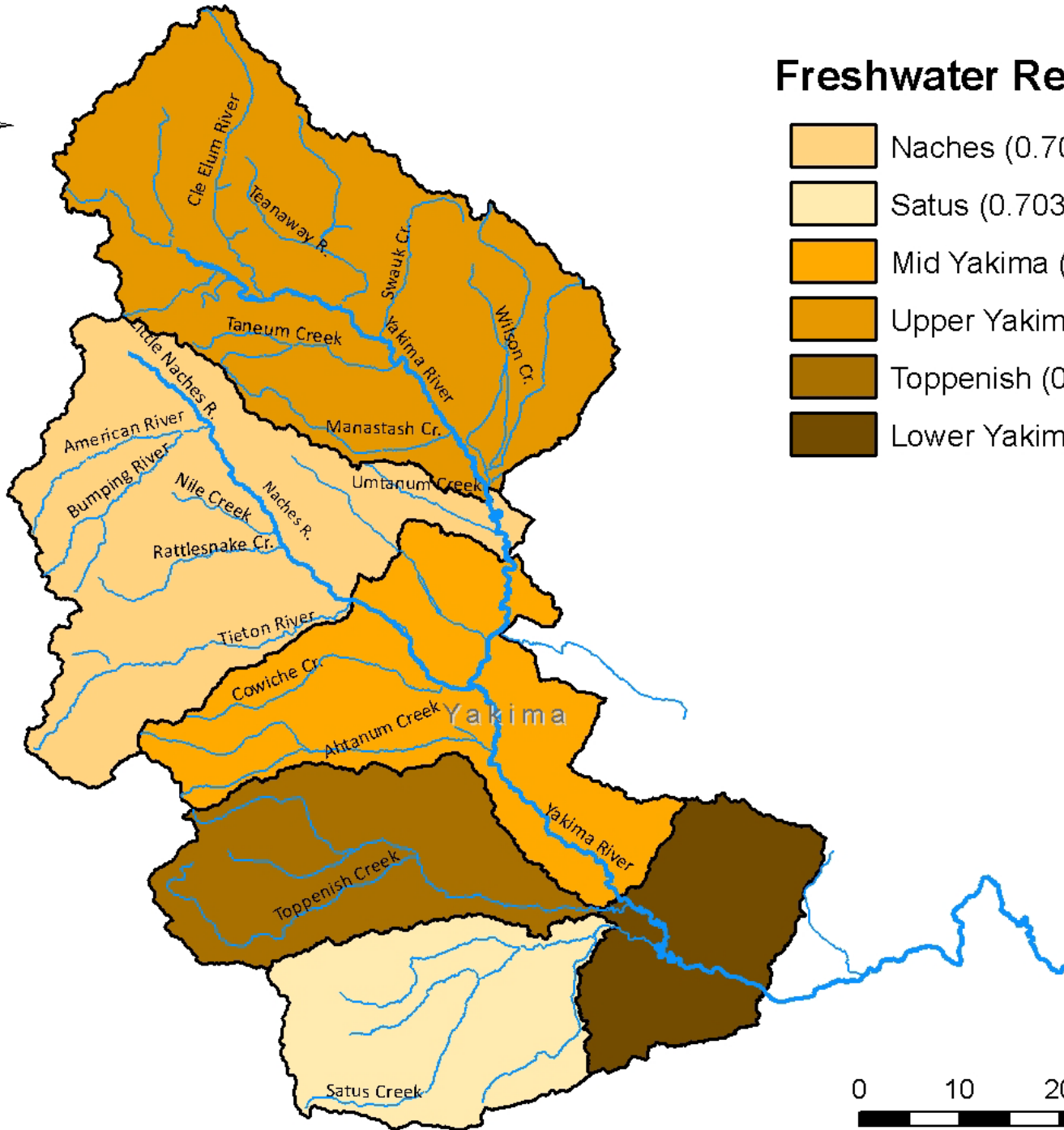
Questions/Comments





Freshwater Rearing Regions

-  Naches (0.7040 - 0.7050)
-  Satus (0.7039)
-  Mid Yakima (0.7052 - 0.7053)
-  Upper Yakima (0.7052 - 0.7058)
-  Toppenish (0.7061)
-  Lower Yakima (0.7100)





Maternal Origin

Resident



Anadromous

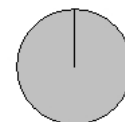
N=9



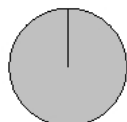
N=63



N=10



N=3



N=4



N=5

Freshwater Rearing Regions

